Bay Area Air Quality Management District
Risk Screening Assessment, A# 9218
Maguire Correctional Facility, P# 14880
July 19, 2004

This document describes the basis for the health risk screening assessment prepared for Maguire Correctional Facility (County of San Mateo), in Redwood City, California. This facility wishes to operate two natural gas fired internal combustion engine generators. In order to do this, the facility must get a permit from the Bay Area Air Quality Management District (BAAQMD). The BAAQMD, as a routine part of the evaluation of a permit application, prepared this screening risk assessment.

Acetaldehyde, benzene, 1,3-butadiene, carbon tetrachloride, chlorobenzene, chloroform, 1,1-Dichloroethane, 1,2-Dichloroethane, ethylbenzene, ethylene dibromide, formaldehyde, methanol, methylene chloride, naphthalene, polycyclic aromatic hydrocarbons, styrene, 1,1,2,2-tetrachloroethane, toluene 1,1,2-trichloroethane, vinyl chloride and xylene which are considered toxic air contaminants (TAC), will be emitted during the operation of the turbines. BAAQMD staff evaluates the possible impact of these TAC emissions that will occur during routine operation of the turbines. The TAC impact is expressed in terms of the increased risk of contracting cancer by individuals who live or work near the proposed turbines.

The estimated cumulative increase in each of the TAC emissions, in pounds per year, that can be expected from these two sources are summarized in the following table based on the facility operating at 8760 hours per year per source:

Toxic Air Contaminant	Annual Average Emissions, lb/yr
Acetaldehyde	37.883
Benzene	21.453
1,3 - Butadiene	9.002
Carbon tetrachloride	0.240
Chlorobenzene	0.175
Chloroform	0.186
1,1 - Dichloroethane	0.153
1,2 - Dichloroethane	0.153
Ethylbenzene	0.337
Ethylene dibromide	0.289
Formaldehyde	278.349
Methanol	0.559
Methylene chloride	0.559
Naphthalene	1.318
PAH's (all 6 as benzo[a]pyrene)	0.037
Styrene	0.162
1,1,2,2 - Tetrachloroethane	0.344
Toluene	7.577
1,1,2 - Trichloroethane	0.208
Vinyl chloride	0.097
Xylene	2.648

Ambient air concentrations of the TAC were predicted using the ISCST3 air dispersion computer model. This model uses information about the facility and the emission rates of toxic air contaminants to estimate what concentrations would be expected in the air at various locations around the site. The estimated concentrations of TAC are used to calculate the possible cancer and noncancer health risk that might be expected to arise from these exposures.

The potential cancer risk was calculated using standard risk assessment methodology. For residents, they include the assumptions that exposures are continuous for 24 hours per day, 7 days per week for 70-years. For students, the assumptions include higher breathing rates for children and that exposures are for 10 hours per day, 180 days per year over a 9-year period. The cancer risk is based on the "best estimates" of plausible cancer potencies as determined by the California Office of Environmental Health Hazard Assessment (OEHHA). The actual cancer risk, which cannot be determined, may approach zero. This type of analysis is considered to be health-protective.

The potential for noncancer health effects is evaluated by comparing the long-term exposure level to a Reference Exposure Level (REL). A REL is a concentration level at or below which no adverse health effects are anticipated. RELs are designed to protect sensitive individuals within the population. Comparisons to RELs are made by determining the hazard index, which is the ratio of the estimated exposure level to the REL.

The proposed operation would result in a maximum increased cancer risk of 0.604 chances in a million and a hazard index of 0.020 for nearby industry. For the students at Sequoia High School, the increased maximum cancer risk is 0.012 chances in a million and the hazard index is 0.002. For the students at Orion Alternative School, the increased maximum cancer risk is 0.008 chances in a million and the hazard index is 0.001. For the students at Summit Preparatory High School, the increased maximum cancer risk is 0.218 chances in a million and the hazard index is 0.036. For the residents nearby, the increased maximum cancer risk is 7.994 chances in a million and the hazard index is 0.171. These health risk values, presented in the table below, meet the criteria for acceptable levels established in the BAAQMD's Risk Management Policy.

Health Risk Results		
Receptor	Maximum Increased Cancer Risk	Hazard Index
Industrial	0.604 chances in a million	0.020
Residential	7.994 chances in a million	0.171
Sequoia High School	0.012 chances in a million	0.002
Orion Alternative School	0.008 chances in a million	0.001
Summit Prep. High School	0.218 chances in a million	0.036